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**UTILITY
PATENT APPLICATION
TRANSMITTAL**

(Only for new nonprovisional applications under 37 CFR 1.53(b))

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TAKAFUMI MIZUNO

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JCS25 U.S. PTO
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APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO:Assistant Commissioner for Patents
Box Patent Application
Washington, DC 202311. ☒ Fee Transmittal Form
(Submit an original, and a duplicate for fee processing)2. ☒ Specification Total Pages 3. ☒ Drawing(s) (35 USC 113) Total Sheets 4. ☒ Oath or Declaration Total Pages a. ☐ Newly executed (original or copy)b. ☒ Unexecuted for information purposesc. ☐ Copy from a prior application (37 CFR 1.63(d))
(for continuation/divisional with Box 17 completed)
[Note Box 5 below]i. ☐ **DELETION OF INVENTOR(S)**
Signed Statement attached deleting inventor(s)
named in the prior application, see 37 CFR
1.63(d)(2) and 1.33(b)5. ☐ Incorporation By Reference (useable if Box 4c is checked)
The entire disclosure of the prior application, from which a copy of the
oath or declaration is supplied under Box 4c, is considered as being
part of the disclosure of the accompanying application and is hereby
incorporated by reference therein.6. ☐ Microfiche Computer Program (Appendix)7. Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)a. ☐ Computer Readable Copyb. ☐ Paper Copy (identical to computer copy)c. ☐ Statement verifying identity of above copies**ACCOMPANYING APPLICATION PARTS**8. ☐ Assignment Papers (cover sheet & document(s))9. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney
(when there is an assignee)10. ☐ English Translation Document (if applicable)11. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS
Citations12. ☐ Preliminary Amendment13. ☒ Return Receipt Postcard (MPEP 503)
(Should be specifically itemized)14. ☐ Small Entity Statement(s) ☐ Statement filed in prior application
Status still proper and desired15. ☐ Certified Copy of Priority Document(s)
(if foreign priority is claimed)16. ☐ Other: _____

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No. ____/____**18. CORRESPONDENCE ADDRESS**☒ Customer Number or Bar Code Label05514
(Insert Customer No. or Attach bar code label here)or ☐ Correspondence address below

NAME

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Fax

CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS (37 CFR 1.16(c))	23-20 =	3	X \$ 18.00 =	\$54.00
	INDEPENDENT CLAIMS (37 cfr 1.16(b))	3-3 =	0	X \$ 78.00 =	\$0
	MULTIPLE DEPENDENT CLAIMS (if applicable) (37 CFR 1.16(d))			\$260.00 =	\$0
				BASIC FEE (37 CFR 1.16(a))	\$760.00
	Total of above Calculations =				\$814.00
	Reduction by 50% for filing by small entity (Note 37 CFR 1.9, 1.27, 1.28).				
	TOTAL =				\$814.00

19. Small entity status

- a. ☐ A Small entity statement is enclosed
- b. ☐ A small entity statement was filed in the prior nonprovisional application and such status is still proper and desired.
- c. ☐ Is no longer claimed.

20. ☒ A check in the amount of \$ 814.00 to cover the filing fee is enclosed.

21. ☐ A check in the amount of \$ _____ to cover the recordal fee is enclosed.

22. The Commissioner is hereby authorized to credit overpayments or charge the following fees to Deposit Account No. 06-1205:

- a. ☒ Fees required under 37 CFR 1.16.
- b. ☒ Fees required under 37 CFR 1.17.
- c. ☐ Fees required under 37 CFR 1.18.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

NAME	Jack M. Arnold
SIGNATURE	<i>Jack M. Arnold Reg. No. 25,823</i>
DATE	November 23, 1999

DOCUMENT TYPE DEFINITION GENERATING METHOD AND
APPARATUS, AND STORAGE MEDIUM FOR STORING PROGRAM

BACKGROUND OF THE INVENTION

5 Field of the Invention

The present invention relates to a computerized document processing executed by a personal computer, a word processor, and the like, particularly to a method and apparatus for generating the document type
10 definition of a structured document, and a storage medium in which a program is stored.

Related Background Art

In recent years, the computerized documents prepared by a personal computer, a word processor, and
15 the like have widely been used. The introduction of a structured document is advanced in which the computerized document is consistently treated and the elements constituting the document are provided with semantic information. In this structured document,
20 each document element is held between front and back tags including element names (tag names), and in many cases description is performed for each document type in accordance with the document type definition of defining a place, order, frequency and the like in
25 which the element appears.

On the other hand, the structured document can be described without preparing the document type

definition. However, when the documents prepared by a plurality of users are integrated to form one document, and if the individual users use the tags having arbitrary titles, there is a possibility of attaching
5 different tag names to the same element, or conversely attaching the same tag name to different elements.

In this case, there arise problems that the semantic information attached to the tag cannot correctly be handled, and that redundancy is generated
10 with respect to the tag.

SUMMARY OF THE INVENTION

An objective of the present invention is to provide a method and apparatus for generating document
15 type definition from a structured document provided with tags, and a storage medium which stores the program.

Another objective of the present invention is to provide a document type definition generating method
20 and apparatus which can correctly treat semantic information given to tags, and a storage medium which stores the program.

Further objective of the present invention is to provide a document type definition generating method
25 and apparatus which can generate document type definition with redundancy to tags removed therefrom, and a storage medium which stores the program.

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According to one aspect, the present invention which achieves these objectives relates to a document processing method comprising: in a structured document provided with a tag having an element name in each document element, a physical structure judging step of judging a physical structure of each document element; a semantic structure judging step of judging a semantic structure of the document element; and a document type definition generating step of generating document type definition to define appearance state of the document element in the structured document based on judgment results of the physical structure judging step and the semantic structure judging step.

According to another aspect, the present invention which achieves these objectives relates to a document processing apparatus comprising: in a structured document provided with a tag having an element name in each document element, physical structure judging means for judging a physical structure of each document element; semantic structure judging means for judging a semantic structure of the document element; and document type definition generating means for generating document type definition to define appearance state of the document element in the structured document based on judgment results of the physical structure judging means and the semantic structure judging means.

According to still another aspect, the present invention which achieves these objectives relates to a computer-readable storage medium storing a document type definition generating program for controlling a computer to perform document type definition generation, the program comprising codes for causing the computer to perform, in a structured document provided with a tag having an element name in each document element, a physical structure judging step of judging a physical structure of each document element, a semantic structure judging step of judging a semantic structure of the document element, and a document type definition generating step of generating document type definition to define appearance state of the document element in the structured document based on judgment results of the physical structure judging step and the semantic structure judging step.

Other objectives and advantages besides those discussed above shall be apparent to those skilled in the art from the description of a preferred embodiment of the invention which follows. In the description, reference is made to accompanying drawings, which form a part thereof, and which illustrate an example of the invention. Such example, however, is not exhaustive of the various embodiments of the invention, and therefore reference is made to the claims which follow the description for determining the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram of a document type definition generating apparatus.

Fig. 2 is a flowchart showing the procedure of a document type definition generation processing.

Figs. 3A and 3B are diagrams showing examples of structured document data.

Fig. 4 is a flowchart showing the processing procedure of physical structure analysis.

Fig. 5 is a flowchart showing the processing procedure of semantic structure analysis.

Fig. 6 is a flowchart showing the processing procedure of removing tag redundancy.

Fig. 7 is a diagram showing one example of document type definition.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A preferred embodiment of the present invention will be described hereinafter with reference to the accompanying drawings.

<First Embodiment>

Fig. 1 is a block diagram of a document type definition generating apparatus according to the present invention.

In Fig. 1, an input unit 101 is constituted of a keyboard, a pointing apparatus, and the like, and is used for a user to input data or commands. An external

memory unit 102 is constituted of a storage apparatus using media such as a hard disk to store structured document data as a processing object, data of semantic information database (DB) described later, generated document type definition, and the like. A display unit 103 is constituted of CRT, a liquid crystal display, and the like to display the structured document data, the generated document type definition, and the like.

A CPU 104 performs control of each component of the apparatus, reads and executes a program, and realizes various processings. A ROM 105 stores fixed data and program. A control program for realizing a processing procedure as described later with reference to the flowcharts of Fig. 2 to 6 may be stored in the ROM 105, or read from the external memory unit 102. A RAM 106 presents an operation area necessary for the processing of the apparatus. A bus 107 connects the apparatus components.

Fig. 2 is a flowchart showing the procedure of a document type definition generation processing according to the present invention.

First, the structured document is inputted in step S201. This is executed by reading the structured document from the external memory unit 102. One example of the structured document given herein is shown in Fig. 3A. For example, a first line "<Title>" indicates a start tag, "</Title>" indicates an end tag,

and "TV SET OPERATING INSTRUCTIONS" held between these tags is a document element indicating a tag content. Moreover, "Title" is an element name (tag name). Furthermore, the attribute and value of the element can be described in the tag.

In the next step S202, each tag position is detected from the structured document, and a tag number is attached in order from the top "<Title>".

Subsequently, in step S203, the physical structure in the document is detected. For example, in Fig. 3B, as diagrammatically represented in "<Para>" indicating a paragraph, a feature that a sentence group starting with an indentation is regarded as the paragraph is detected. The processing procedure for detecting such physical structure is shown in the flowchart of Fig. 4.

First, in step S401, a line in which indentation is performed is found in the document, and in the next step S402 the sentence group following the line is detected. In this case, the line in which the indentation is performed to the line in which the next indentation is performed, or to the line right before a blank line can be set to the sentence group. In this case, the indentation (double indentation) performed in quotation in which the quotation is represented by performing the indentation, and blank lines described by constantly skipping one or more lines are excluded as structures meaningless for the detection of the

physical structure from the entire document pattern to perform the processing in the step S402.

Turning back to Fig. 2, in the next step S204, the semantic structure of the inputted structured document is detected. As one example, in Fig. 3A, the contents of tags "<Section>" have forms in which "1.", "2.", "3." are attached to top positions. Here, the content of tag "<Section>" can semantically be presumed to have "numeral." on its top. One example of processing procedure for detecting the semantic structure is shown in the flowchart of Fig. 5.

First, in step S501, communication is performed with a semantic information database (DB) 51 with respect to all words and codes in the document to provide the connection between words in the document and the types of words and codes. In the next step S502, the semantic structure found in each document element is detected based on this result.

Returning to Fig. 2, in the next step S205, a first appearing tag is regarded as the tag to be processed, and it is judged in step S206 whether or not the processing of the tag is all completed.

When the tag processing is not completed, the process shifts to step S207, in which the tag as the present processing object, and the information on the physical and semantic structures detected in the steps S203 and 204 are unified. Here, the unifying means

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that when physical and semantic features are present in the line related with the tag used as the present processing object, the tag and the information are connected. Subsequently, in step S208, the process is
5 moved to the next appearing tag, thereby returning to the step S206.

On the other hand, when it is judged in the step S206 that the tag processing is all completed, the process shifts to step S209, in which similarity is
10 obtained between the tags having different titles. When the similarity is equal to or more than a predetermined threshold value, the tags are regarded as the same tag, and one of the tags is prevented from appearing on the document type definition to be
15 generated. The processing procedure for obtaining this similarity to determine whether or not the tags have the same content is shown in the flowchart of Fig. 6.

First, the similarity of tags A, B having different titles is calculated in step S601. This
20 calculating method comprises setting the similarity of the physical structure to 1 when the physical structures agree with each other. When the physical structures do not completely agree with each other, but partially agree with each other, the similarity of the
25 physical structure is set to a value less than 1 which corresponds to the agreed proportion. The similar concept is applied to the semantic structure, and the

similarity of the semantic structure is obtained. The dividing of the sum of the similarity of the physical structure and the similarity of the semantic structure by 2 results in a general similarity d_{AB} of A and B.

5 In the next step S602, the similarity d_{AB} obtained in the step S601 is compared with the predetermined threshold value δ . When the similarity d_{AB} is less than δ , the process jumps to step S604 for trial of the next combination.

10 When the similarity d_{AB} is equal to or more than the threshold value δ , the process shifts to step S603, in which the tag B is regarded as being of the same type as the tag A, the tag B is finally struck off a list for generating the document type definition, and
15 redundancy is removed.

When the processing of the step S603 is completed, the process advances to step S604, in which it is judged whether or not the trial of combination of all tags is made. When the combination of all tags is not
20 tried, the process returns to the step S601. When the combination of all tags is tried, the subroutine processing is ended to return to the main routine of Fig. 2.

Moreover, in the step S209, in addition to the
25 above-described processing of Fig. 6, the physical structure and semantic structure of the document elements having the same title are compared. When the

structures are different, the title of one of the tags is changed. For this purpose, the similarity is obtained between tags Aa and Ab having the same tag name in the same manner as described above. When
5 similarity value d_{aaAb} is less than the threshold value, the title of the tag Ab is changed. This threshold value may be different from the above-described value.

In step S210 of Fig. 2, the sentence word between the start tag and the end tag which have the same title
10 is analyzed to obtain the information to be included in the tags. This analysis result is used to generate the document type definition in the next step S211.

Fig. 7 is a diagram showing one example of the generated document type definition, and the document
15 type definition generated from the structured document data shown in Fig. 3A is shown as document type "manual".

Here, in Fig. 3A, the content of tag <Sect> agrees in physical structure with the content of tag
20 <Section>, and the tags are the same in semantic structure in that they have the form of "numeral.". Therefore, it is determined in the step S209 that the tag <Sect> has the same content as that of the tag <Section>. As a result, the generated document type
25 definition does not use <Sect>, and in <Body>, Section+, that is, tag <Section> repeatedly appears.
<Second Embodiment>

In the above-described first embodiment, the physical and semantic structures in the document are judged based on the sentence (portions other than tags), but the present invention is not limited to this.

For example, the physical information such as the relative positional relation between the tags and the inclusive relation of the tags is detected as the physical structure, or the meaning represented by the tag name or attribute is detected as the semantic structure, so that these structures may be used as the objects to obtain the similarity.

According to the embodiments described above, since the physical and semantic structures of the document element surrounded with the tags are judged, and the document type definition of the structured document provided with the tags is generated, the semantic information given to the tags can correctly be treated.

Furthermore, the redundancy to the tags having the same content can be removed, and the document type definition can be generated in which there are no tags being the same in title and different in meaning.

Additionally, the present invention may be applied to a computer system constituted of a plurality of apparatuses (e.g., host computer, interface apparatus, reader, printer, and the like), or to a device

constituted of one apparatus (e.g., word processor, copying machine, facsimile device, and the like).

Moreover, it goes without saying that the objective of the present invention can be achieved by
5 supplying a storage medium storing the program code of software to realize the function of the above-described embodiment to the system or the device, and reading and executing the program code stored in the storage medium by the computer (or CPU or MPU) of the system or the
10 device.

In this case, the program code itself read from the storage medium realizes the function of the above-described embodiment, and the storage medium in which the program code is recorded constitutes the present
15 invention.

As the storage medium in which the program code, and tables and other variable data are stored, for example, a floppy disk (FD), a hard disk, an optical disk, an optomagnetic disk, CD-ROM, CD-R, a magnetic
20 tape, a nonvolatile memory card (IC memory card), ROM, and the like can be used.

Moreover, the function of the above-described embodiment is realized by executing the program code read by the computer, but it goes without saying that
25 the present invention also includes a case in which an operating system (OS) operating on the computer performs a part or the whole of an actual processing

based on the instruction of the program code and the function of the above-described embodiment is realized by the processing.

Although the present invention has been described
5 in its preferred form with a certain degree of
particularity, many apparently widely different
embodiments of the invention can be made without
departing from the spirit and the scope thereof. It is
to be understood that the invention is not limited to
10 the specific embodiments thereof except as defined in
the appended claims.

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WHAT IS CLAIMED IS:

1. A document type definition generating method,
comprising, in a structured document provided with a
tag having an element name in each document element:

5 a physical structure judging step of judging a
physical structure of each document element;

a semantic structure judging step of judging a
semantic structure of said each document element; and

10 a document type definition generating step of
generating document type definition to define
appearance state of the document element in said
structured document based on judgment results of said
physical structure judging step and said semantic
structure judging step.

15

2. The document type definition generating method
according to claim 1, wherein said physical structure
judging step comprises judging the physical structure
of the document element based on an indentation or a
20 blank line.

3. The document type definition generating method
according to claim 2, wherein when the physical
structure of the document element is judged based on
25 said indentation, the judging is performed by excluding
the indentation which represents quotation.

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4. The document type definition generating method according to claim 2, wherein when the physical structure of the document element is judged based on said blank line, the judging is performed by excluding
5 the blank line from a document in which description is made by constantly placing every predetermined number of blank lines.

5. The document type definition generating method
10 according to claim 1, wherein said physical structure judging step comprises judging the physical structure of the document element based on a positional relation of the tags surrounding the document element.

6. The document type definition generating method
15 according to claim 1, wherein said semantic structure judging step comprises referring to a semantic information database to judge the semantic structure of the document element based on words and phrases
20 connection in a document and word types.

7. The document type definition generating method according to claim 1, wherein said semantic structure
judging step comprises judging the semantic structure
25 of the document element based on a meaning represented by the tags surrounding the document element.

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8. The document type definition generating method according to claim 1, wherein said document type definition generating step comprises a redundancy removing step of, when the physical structure and the semantic structure of a plurality of document elements having the tags different in element name are similar, regarding the document elements as being of the same type and excluding one element name from a document type definition generating object based on the judgment results of said physical structure judging step and said semantic structure judging step.

9. The document type definition generating method according to claim 8, wherein said redundancy removing step comprises obtaining similarity degrees concerning agreement degrees of the physical structure and the semantic structure between the document elements having the tags different in element name, and regarding the document elements as being of the same type when a general similarity value calculated from the similarity degrees is equal to or more than a predetermined threshold value.

10. The document type definition generating method according to claim 1, wherein said document type definition generating step comprises a title changing step of, when the physical structure and the semantic

structure of a plurality of document elements having
the tags with the same element name are different,
regarding the document elements as being of different
types and changing one element name based on the
5 judgment results of said physical structure judging
step and said semantic structure judging step.

11. The document type definition generating
method according to claim 1, wherein said document type
10 definition generating step comprises analyzing words
and phrases present between a start tag and an end tag
having the same title, obtaining information to be
included between the tags, and generating the document
type definition based on the information.

15

12. A document type definition generating
apparatus comprising: in a structured document provided
with a tag having an element name in each document
element,

20 physical structure judging means for judging a
physical structure of said each document element;

semantic structure judging means for judging a
semantic structure of said each document element; and

document type definition generating means for
25 generating document type definition to define
appearance state of the document element in said
structured document based on judgment results of said

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physical structure judging means and said semantic structure judging means.

13. The document type definition generating apparatus according to claim 12, wherein said physical structure judging means judges the physical structure of the document element based on an indentation or a blank line.

14. The document type definition generating apparatus according to claim 13, wherein said physical structure judging means judges the physical structure of the document element based on said indentation by excluding the indentation which represents quotation.

15. The document type definition generating apparatus according to claim 13, wherein said physical structure judging means judges the physical structure of the document element based on said blank lines by excluding the blank lines from a document in which description is made by constantly placing every predetermined number of blank lines.

16. The document type definition generating apparatus according to claim 12, wherein said physical structure judging means judges the physical structure of the document element based on a positional relation

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of the tags surrounding the document element.

17. The document type definition generating apparatus according to claim 12, wherein said semantic structure judging means refers to a semantic information database to judge the semantic structure of the document element based on words and phrases connection in a document and word types.

18. The document type definition generating apparatus according to claim 12, wherein said semantic structure judging means judges the semantic structure of the document element based on a meaning represented by the tags surrounding the document element.

19. The document type definition generating apparatus according to claim 12, wherein said document type definition generating means comprises redundancy removing means for, when the physical structure and the semantic structure of a plurality of document elements having the tags different in element name are similar, regarding the document elements as being of the same type and excluding one element name from a document type definition generating object based on the judgment results of said physical structure judging means and said semantic structure judging means.

20. The document type definition generating apparatus according to claim 19, wherein said redundancy removing means obtains similarity degrees concerning agreement degrees of the physical structure and the semantic structure between the document elements having the tags different in element name, and regards the document elements as being of the same type when a general similarity value calculated from the similarity degrees is equal to or more than a predetermined threshold value.

21. The document type definition generating apparatus according to claim 12, wherein said document type definition generating means comprises title changing means for, when the physical structure and the semantic structure of a plurality of document elements having the tags with the same element name are different, regarding the document elements as being of different types and changing one element name based on the judgment results of said physical structure judging means and said semantic structure judging means.

22. The document type definition generating apparatus according to claim 12, wherein said document type definition generating means analyzes words and phrases present between a start tag and an end tag having the same title, obtains information to be

included between the tags, and generates the document type definition based on the information.

23. A computer-readable storage medium storing a
5 document type definition generating program for
controlling a computer to perform document type
definition generation, said program comprising codes
for causing the computer to perform:

in a structured document provided with a tag
10 having an element name in each document element, a
physical structure judging step of judging a physical
structure of each document element;

a semantic structure judging step of judging a
semantic structure of said each document element; and

15 a document type definition generating step of
generating document type definition to define
appearance state of the document element in said
structured document based on judgment results of said
physical structure judging step and said semantic
20 structure judging step.

ABSTRACT OF THE DISCLOSURE

There is disclosed a document type definition generating method comprising, in a structured document provided with a tag having an element name in each

5 document element, judging a physical structure of each document element from indentation, blank lines, and positional relation between tags, analyzing words and phrases in each document element, and judging a semantic structure of the document element based on

10 words and phrases connection and word types. When the physical and semantic structures of document elements having tags different in element name are similar, the elements are regarded as being of the same type and one element name is excluded from a list for generating the

15 document type definition. When the physical and semantic structures of document elements having tags with the same element name are different, the elements are regarded as being of the different types and one element name is changed. Furthermore, the words and

20 phrases between a start tag and an end tag with the same title are analyzed, and the information to be included between the tags is obtained to generate the document type definition. Thereby, tag meaning is correctly treated, and the document type definition

25 with tag redundancy removed therefrom is generated.

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FIG. 1

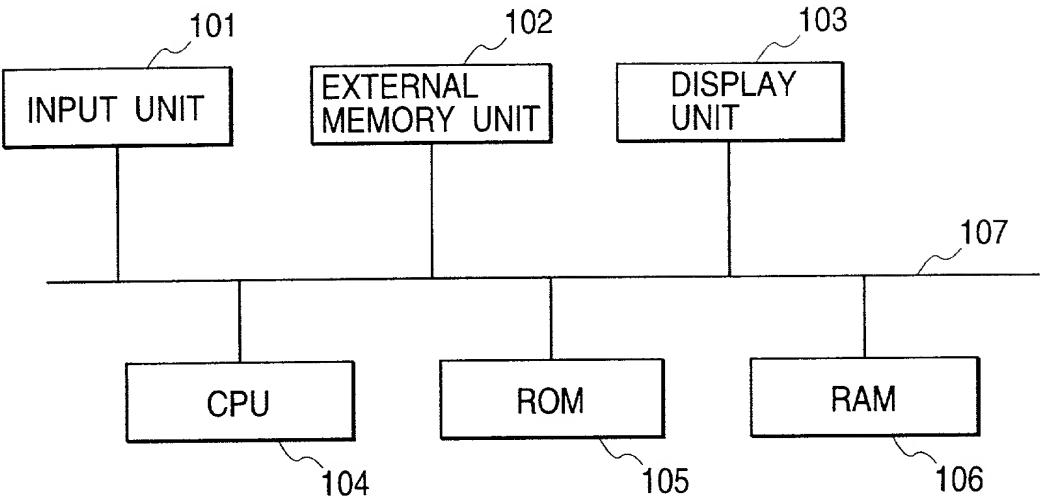


FIG. 2

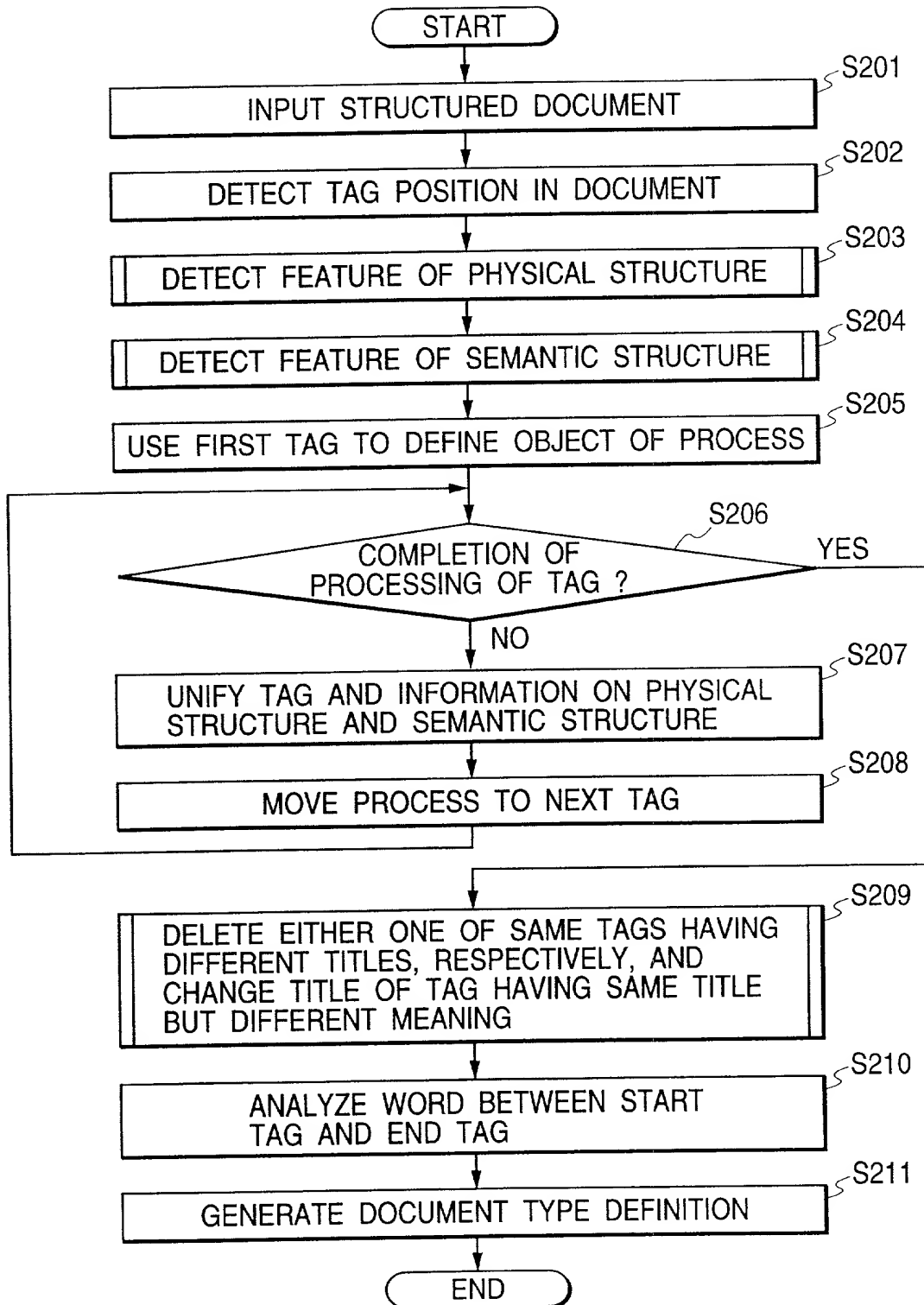


FIG. 3A

```

<Title>TV SET OPERATING INSTRUCTIONS</Title>
<Date>19998.2.1</Date>
<Author>TARO YAMADA</Author>
<Body>
  <Section>1. PLUG IN</Section>
  <Section>2. TURN ON POWER</Section>
  <Section>3. TUNE IN</Section>
  <Sect>4. CONTROL VOLUME</Sect>
</Body>

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FIG. 3B

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<Para>
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</Para>

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<Para>
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</Para>

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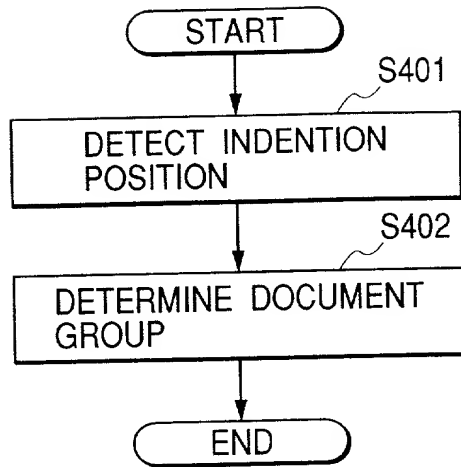
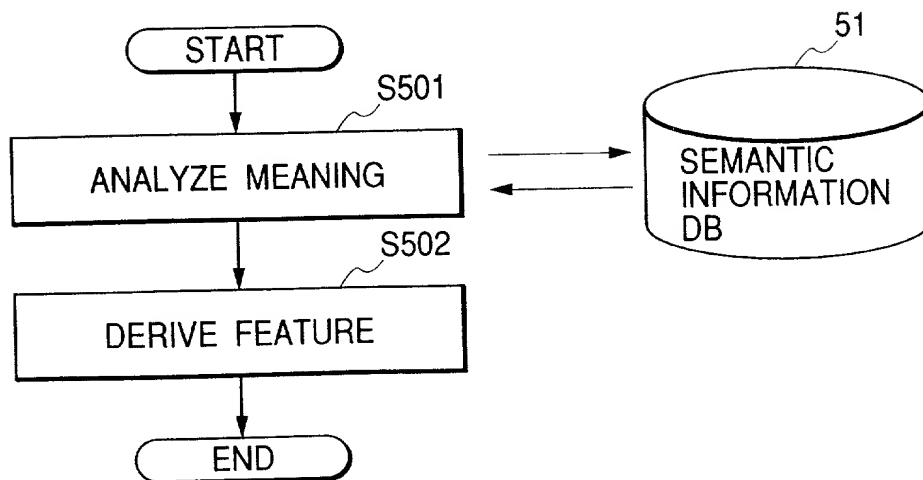
FIG. 4*FIG. 5*

FIG. 6

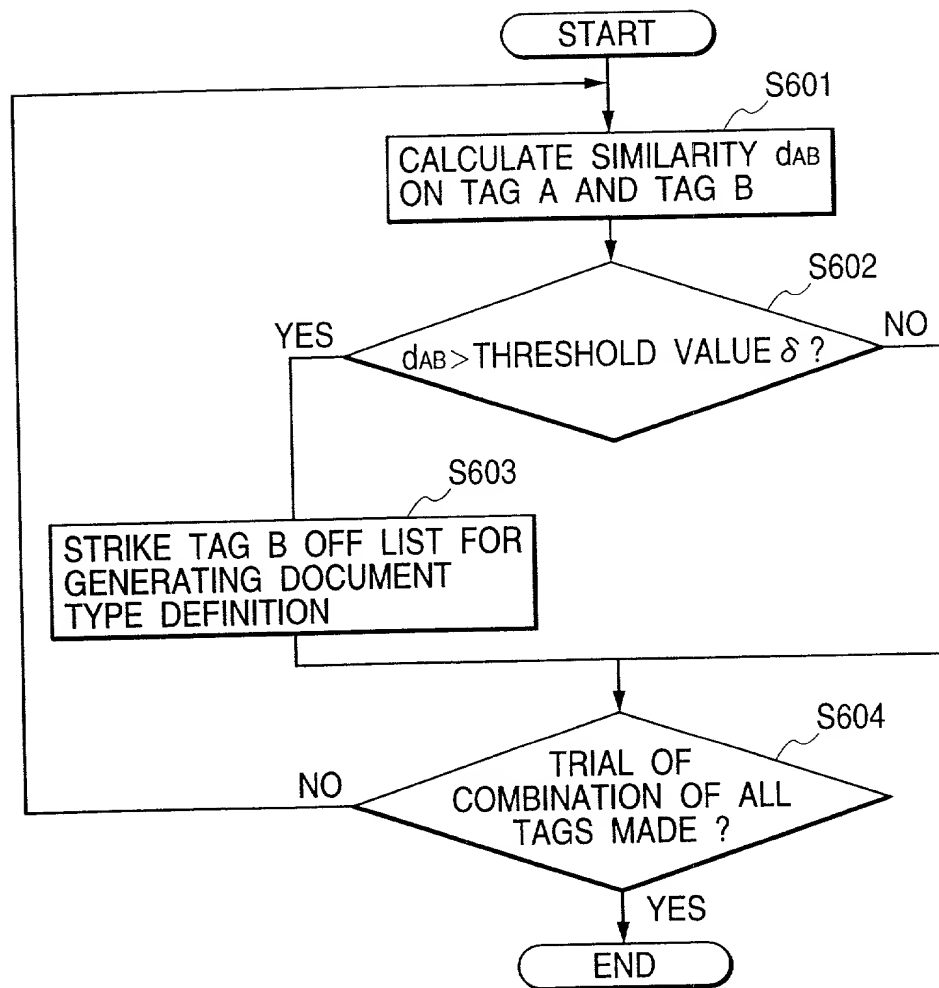


FIG. 7

```
<!DOCTYPE manual [  
  <!ELEMENT manual (Title, Date, Author, Body)>  
  <!ELEMENT Title (#PCDATA)>  
  <!ELEMENT Date (#PCDATA)>  
  <!ELEMENT Author (#PCDATA)>  
  <!ELEMENT Body (Section+)>  
  <!ELEMENT Section (#PCDATA)>  
>
```

**COMBINED DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION**
(Page 1)

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled DOCUMENT TYPE DEFINITION GENERATING METHOD AND APPARATUS, AND STORAGE MEDIUM FOR STORING PROGRAM

the specification of which ☒ is attached hereto ☐ was filed on _____ as United States Application No. or PCT International Application No. _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b), of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT international application which designates at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT international application having a filing date before that of the application on which priority is claimed.

<u>Country</u>	<u>Application No.</u>	<u>Filed (Day/Mo./Yr.)</u>	<u>(Yes/No) Priority Claimed</u>
Japan	10-336278	26/11/98	Yes

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s), or §365(c) of any PCT international application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

<u>Application No.</u>	<u>Filed (Day/Mo./Yr.)</u>	<u>Status (Patented, Pending, Abandoned)</u>
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I hereby appoint the practitioners associated with the firm and Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to the address associated with that Customer Number:

FITZPATRICK, CELLA, HARPER & SCINTO
Customer Number: 05514

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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